

REMARKS

The Office Action of January 24, 2007 has been received and reviewed.

Claims 1-16 and 23-28 are currently pending and under consideration in the above-referenced application, each standing rejected.

Reconsideration of the above-referenced application is respectfully requested.

Rejections under 35 U.S.C. § 112, First Paragraph

Claims 1 and 23 have been rejected under 35 U.S.C. § 112, first paragraph, for reciting subject matter that purportedly lacks an adequate written description in the as-filed specification. Specifically, it has been asserted that the as-filed specification does not provide an adequate written description for consolidation sites or fabrication sites that are “isolated.”

Independent claims 1 and 23 have both been amended to recite systems that include a plurality of individual fabrication chambers. Support for the “individual fabrication chambers” recited in independent claims 1 and 23 is provided in the as-filed specification, for example, at paragraph [0061] and in FIG. 2.

Accordingly, it is respectfully submitted that the subject matter recited in amended independent claims 1 and 23 complies with the written description requirement of 35 U.S.C. § 112, first paragraph.

Obviousness-Type Double Patenting Rejection

Claims 1-16 and 23-28 stand rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 33 of U.S. Patent Application 10/705,250.

It is respectfully requested that the obviousness-type double patenting rejections of claims 1-16 and 23-28 be held in abeyance until all other issues in the above-referenced application have been resolved.

Rejections under 35 U.S.C. § 102

Claims 1-4 and 7-16 are rejected under 35 U.S.C. § 102.

A claim is anticipated only if each and every element, as set forth in the claim, is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Bradbury

Claims 1-3 have been rejected under 35 U.S.C. § 102(e) for being drawn to subject matter that is allegedly anticipated by the subject matter described in U.S. Patent Application Publication 2002/0007294 of Bradbury et al. (hereinafter “Bradbury”).

Bradbury describes a system in which patient data is transmitted to a three-dimensional printing apparatus by way of a computer network to facilitate fabrication of a biomedical device.

Bradbury does not expressly or inherently describe that the system may include a plurality of individual fabrication chambers. Rather, the disclosure of Bradbury is limited to a system on which patient data and design data may be processed, evaluated, and eventually transmitted to a three-dimensional printing apparatus. See paragraphs [0038] to [0040]. It is well known in the art and can be seen from the U.S. Patents referenced by Bradbury that the three-dimensional printing apparatus that Bradbury describes as being useful for constructing the disclosed biomedical devices includes only one location, or work area, in which biomedical devices are fabricated. In fact, the Office has quoted language from Bradbury that states that a “whole tray or bed of similar parts,” i.e., *one fabrication site*, may be printed “in one run. While it is understood that Bradbury describes that multiple articles may be manufactured at different locations within a single work area of a three-dimensional printing apparatus (see, e.g., paragraph [0059]), it is respectfully submitted that these different locations of the same work area do not comprise a plurality of “individual fabrication chambers,” as required by amended independent claim 1. As such, Bradbury does not anticipate each and every element of amended independent claim 1, as would be required to maintain the 35 U.S.C. § 102(e) rejection of amended independent claim 1.

Claims 2 and 3 are both allowable, among other reasons, for respectively depending directly and indirectly from independent claim 1, which is allowable.

Claim 2 is additionally allowable since the description of Bradbury is limited to a computer network that communicates with a single three-dimensional printing apparatus. Thus, Bradbury does not expressly or inherently describe a material consolidation system that is common to a plurality of programmed material consolidation sites.

Claim 3, which depends directly from claim 2, is also allowable since Bradbury lacks any express or inherent description of a location control element that is common to a plurality of programmed material consolidation sites.

Aronsatein

Claims 1-4 and 7-16 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter that is purportedly anticipated by the disclosure of U.S. Patent 3,889,355 to Aronsatein et al. (hereinafter “Aronsatein”).

The description of Aronsatein relates to a system for conveying individual semiconductor wafers from one semiconductor device fabrication process sector to another. Aronsatein provides examples of semiconductor device fabrication process sectors, including an oxidation sector, a source and drain implantation sector, a gate oxidation sector, a pattern generating unit, a metallization sector, and a sintering sector. Col. 23, lines 59-66. Each wafer may be identified and moved under control of a computer. Col. 24, line 17, to col. 26, line 4.

By its plain language, the phrase “programmed material consolidation” refers to processes in which material is consolidated in accordance with or under control of a program. Conventional semiconductor device fabrication processes do not include “programmed material consolidation.” They instead include conventional photolithography processes. A conventional photolithography process is not a “programmed material consolidation” process, as conventional photolithography processes include consolidation of a resist by exposing the same to light or other electromagnetic radiation through a reticle, then exposing the resist to chemical developers. No program is required to effect the basic acts of a conventional photolithography process.

Conventional semiconductor device fabrication processes also employ material deposition chambers. The consolidation of material films in deposition chambers does not include consolidation of the material in accordance with or under control of a program; rather, in deposition chambers, material consolidates in a nonspecific manner (*i.e.*, as a film) as chemical reactants that are introduced into the chamber react with each other under appropriate conditions (*e.g.*, temperature, pressure, etc.).

Nor does any other conventional semiconductor device fabrication process include “programmed material consolidation.”

The semiconductor device fabrication system described in Aronsatein merely includes a component for conveying individual semiconductor wafers from one *conventional* semiconductor device fabrication process sector to another.

In view of the foregoing, it is apparent that Aronsatein lacks any express or inherent description of a *programmed material consolidation system* with a plurality of individual fabrication chambers, each of which includes a *programmed material consolidation site*, as recited in independent claim 1. As such, it is respectfully submitted that, under 35 U.S.C. § 102(b), the subject matter recited in independent claim 1 is allowable over the subject matter described in Aronsatein.

Each of claims 2-4, 7, 8, and 12-15 is allowable, among other reasons, for depending directly or indirectly from amended independent claim 1, which is allowable.

Claim 2 is additionally allowable since the description of Aronsatein is limited to a substrate conveyor system that is common to a plurality of conventional semiconductor device fabrication chambers. As such, Aronsatein does not expressly or inherently describe a common component that comprises a *selective* material consolidation system.

Claim 3, which depends directly from claim 2, is also allowable since Aronsatein lacks any express or inherent description of a location control element that is common to a plurality of programmed material consolidation sites.

Claim 4 depends from claim 3 and is additionally allowable since Aronsatein neither expressly nor inherently describes a location control element that is configured to direct consolidating energy to a selected fabrication chamber of a programmed material consolidation

system. Again, the description of Aronsatein is limited to a substrate conveyor system for use with conventional semiconductor device fabrication chambers.

Claim 7 is further allowable because Aronsatein includes no express or inherent description of a cleaning component that is common to a plurality of programmed material consolidation sites.

Withdrawal of the 35 U.S.C. § 102 rejections of claims 1-4 and 7-16 is respectfully solicited, as is the allowance of each of these claims.

Rejections under 35 U.S.C. § 103(a)

Claims 1-16 and 23-28 have been rejected under 35 U.S.C. § 103(a).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.
In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Grigg in View of Tischler

Claims 1-5, 7, 8, and 10-16 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over the subject matter taught in U.S. Patent 6,337,122 to Grigg et al. (hereinafter "Grigg"), in view of teachings from U.S. Patent Application Publication 2003/0114016 of Tischler (hereinafter "Tischler").

Independent claim 1, as amended and presented herein, recites a programmed material consolidation system that includes a plurality of individual fabrication chambers, each including

a programmed material consolidation site, as well as at least one common component useful with more than one of the plurality of individual fabrication chambers.

The teachings of Grigg are limited to a programmed material consolidation system that includes a single fabrication chamber, not a plurality of fabrication chambers. Thus, the components of that system are useful with only one fabrication chamber. The programmed material consolidation system disclosed in Grigg is a stereolithography apparatus that includes a platen, upon which an object is to be formed, that may be incrementally lowered into a reservoir that contains liquid photopolymer and that is configured to maintain a surface of the liquid photopolymer at a constant, or fixed, level. Col. 9, line 44, to col. 10, line 40.

Tischler teaches a wafer carrier that may be used in conjunction with process tools such as an “epitaxial thin film deposition reactor.” Paragraph [0007]. Specifically, the wafer carrier of Tischler, which is configured to be assembled with a recess of a susceptor of an epitaxial thin film deposition reactor, includes one or more receptacles that will receive wafers of different sizes than the receptacle of the susceptor is configured to receive. Paragraphs [0031] and [0033]. The wafer carriers of Tischler act as adapters that allow epitaxial thin film deposition reactors to hold substrates with shapes or dimensions that differ from the substrate shapes or dimensions that the reactors were designed to contain. Paragraph [0008].

Notable examples of epitaxial thin film deposition reactors include sputtering chambers and other physical vapor deposition (PVD) reactors, chemical vapor deposition (CVD) reactors, and atomic layer deposition (ALD) reactors. As epitaxial thin film deposition chambers deposit material indiscriminately, rather than in accordance with a program, epitaxial thin film deposition chambers are not capable of effecting programmed material consolidation processes.

It is respectfully submitted that Grigg and Tischler do not provide teachings that support a *prima facie* case of obviousness against any of claims 1-5, 7, 8, or 10-16.

In particular, it is respectfully submitted that, without the benefit of hindsight that has been made available to the Office by the claims and disclosure of the above-referenced application, one of ordinary skill in the art wouldn’t have been motivated to immerse the wafer carrier of Tischler within the liquid-filled chamber of a programmed material consolidation apparatus of the type disclosed in Grigg. Specifically, Tischler does not provide any motivation

to use the support thereof anywhere other than in a reactor for depositing epitaxial thin films. Moreover, the platform 90 of Grigg includes a planar surface that may receive a substrate of any size, provided the dimensions of the substrate are less than the corresponding dimensions of the reservoir within which the platform 90 is located. Thus, neither Grigg nor Tischler provides one of ordinary skill in the art with any reason to expect the platform 90 of Grigg to be deficient in its ability to hold substrates of various sizes.

Moreover, assuming, *arguendo*, that the carrier of Tischler were used on platform 90 of the apparatus disclosed in Grigg, a technique for securing the carrier, such as the substrate securing process described at col. 8, line 55, to col. 9, line 2, would also have to be devised. As Grigg clearly teaches that one or more substrates could be directly secured to platen 90, the use of the carrier of Tischler with the apparatus disclosed in Grigg would only unnecessarily complicate the process of securing one or more substrates to platen 90.

Furthermore, Tischler lacks any teaching or suggestion that the wafer carrier disclosed therein may be used to transport wafers between a plurality of different sites. Rather, the teachings of Tischler are limited to use of the wafer carrier within a chamber of an epitaxial thin film deposition apparatus. As such, Tischler, like Grigg, lacks any teaching or suggestion of a programmed material consolidation system that includes a plurality of individual fabrication chambers, each of which includes a programmed material consolidation site.

For these reasons, neither Grigg nor Tischler would have provided one of ordinary skill in the art with any motivation to combine their teachings before the earliest date to which a claim for priority has been made in the above-referenced application. Therefore, the teachings of Grigg and Tischler do not support a *prima facie* case of obviousness against any of claims 1-5, 7, 8, or 10-16.

As such, under 35 U.S.C. § 103(a), the subject matter recited in claims 1-5, 7, 8, and 10-16 is allowable over the subject matter taught in Grigg and Tischler.

Grigg, Tischler, and Yamamoto

Claims 6, 9, and 23-28 stand rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly unpatentable over teachings from Grigg, in view of the subject matter

taught in Tischler and, further, in view of teachings from U.S. Patent 5,151,813 to Yamamoto et al. (hereinafter “Yamamoto”).

Claims 6 and 9 are both allowable, among other reasons, for depending indirectly from claim 1, which is allowable.

Claim 9 is additionally allowable since none of Grigg, Tischler, or Yamamoto teaches or suggests a rotary feed system for handling substrates, let alone a programmed material consolidation system that includes a rotary feed system associated with a programmed material consolidation system. More particularly, Grigg, Tischler, and Yamamoto each lack any teaching or suggestion of a programmed material consolidation system with a plurality of individual fabrication chambers, each of which includes a programmed material consolidation site.

Additionally, it is respectfully submitted that a *prima facie* case of obviousness has not been established against any of claims 6, 9, or 23-28 because Yamamoto includes no teaching or suggestion that remedies the above-mentioned deficiency in motivation for one of ordinary skill in the art to have combined the teachings of Grigg and Tischler in the asserted manner.

Furthermore, with respect to the subject matter to which amended independent claim 23 is directed, none of Grigg, Tischler, or Yamamoto teaches or suggests a programmed material consolidation system that includes “means for selectively directing consolidating energy *toward at least two individual fabrication chambers . . .*” (emphasis supplied), as recited in amended independent claim 23. Therefore, it is respectfully submitted that, under 35 U.S.C. § 103(a), the subject matter to which amended independent claim 23 is directed is allowable over the teachings of Grigg, Tischler, and Yamamoto.

Claims 24-28 are each allowable, among other reasons, for depending directly or indirectly from independent claim 23, which is allowable.

Claim 25 is also allowable because none of Grigg, Tischler, or Yamamoto teaches or suggests a programmed material consolidation system that includes “means for removing . . . at least one substrate from a first fabrication chamber . . . as consolidating energy is directed toward a second fabrication chamber . . .”

Claim 27 is additionally allowable since Grigg, Tischler, and Yamamoto each lack any teaching or suggestion of means configured to redirect consolidating energy to a first fabrication

chamber after consolidating energy has been directed toward a distinct, second fabrication chamber.

Caccoma in View of Aronsatein

Claims 23-28 have been rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over the subject matter taught in U.S. Patent 4,027,246 to Caccoma et al. (hereinafter “Caccoma”), in view of teachings from Aronsatein.

The system disclosed in Caccoma is much like that of Aronsatein, with the addition of storage sites for semiconductor wafers.

Both Caccoma and Aronsatein lack any teaching or suggestion of a system that includes “means for selectively directing consolidating energy toward at least two individual fabrication chambers of a programmed material consolidation system . . .,” as recited in amended independent claim 23. More specifically, neither Caccoma nor Aronsatein teaches or suggests means for selectively directing consolidating energy.” Further, neither Caccoma nor Aronsaten includes any teaching or suggestion of a programmed material consolidation system. Rather, the teachings of Caccoma and Aronsatein are limited to systems that include conventional semiconductor device fabrication chambers, which, as explained above, are not capable of material consolidation in accordance with a program, or programmed material consolidation. Thus, under 35 U.S.C. § 103(a), the subject matter recited in independent claim 23 is allowable over the teachings of Caccoma and Aronsatein.

Claims 24-28 are each allowable, among other reasons, for depending directly or indirectly from independent claim 23, which is allowable.

Claim 24 is further allowable since Caccoma and Aronsatein both lack any teaching or suggestion of a system with means configured to direct consolidating energy toward at least one substrate.

Claim 25 is also allowable because neither Caccoma nor Aronsatein teaches or suggests a programmed material consolidation system that includes “means for removing . . . at least one substrate from a first fabrication chamber . . . as consolidating energy is directed toward a second fabrication chamber . . .”

Claim 27 is additionally allowable since Caccoma and Aronsatein both lack any teaching or suggestion of means configured to redirect consolidating energy to a first fabrication chamber after consolidating energy has been directed toward a distinct, second fabrication chamber.

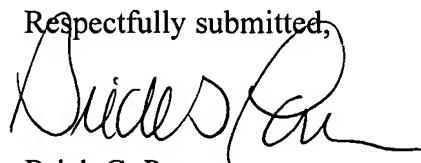
Claim 28 is further allowable because neither Caccoma nor Aronsatein teaches or suggests a system with means for selectively directing a beam of ultraviolet radiation.

It is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 1-16 and 23-28 be withdrawn and that each of these claims be allowed.

CONCLUSION

It is respectfully submitted that each of claims 1-16 and 23-28 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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